

# A Comprehensive Examination of the Wealth Effects of Recent Stock Repurchase Announcements

## Abstract

In this paper we examine the wealth effect of stock repurchase announcements using a sample of 11,862 repurchase programs announced during 1994-2007. The results of several recent industry surveys indicate that managerial motivations for repurchasing shares may have changed in recent years. To better understand the reasons for repurchasing shares we classify our sample in various ways - by year, by the method used for repurchasing shares, by the stated purpose of the program, by the method of financing, and by program size. We find that the median size of firms repurchasing shares has increased dramatically recently, and concomitantly, the announcement returns have declined. Signaling undervaluation of share prices appears to become less important than previously assumed. While smaller firms signal undervaluation using open market repurchases, tender offers are chosen to enhance shareholder values by other means.

## 1. Introduction

The number of firms announcing stock repurchase programs has increased steadily since the mid-1980s. According to a press release by the Standard and Poor's Corporation (S&P), the total dollar amount that was spent annually on stock repurchases by S&P 500 firms was approximately equal to total dividend payments during the late 1990s and the early 2000s (\$130-160 billion annually).<sup>1</sup> However, stock repurchase activity has intensified since then. The total amount spent on repurchases was \$197 billion in 2004, \$349 billion in 2005, \$432 billion in 2006, and \$590 billion in 2007. By comparison, these firms paid \$245 billion of dividends in 2007, out of reported total earnings of \$587 billion. The dramatic increase in recent stock repurchase activity clearly demonstrates the growing importance of repurchase programs in the implementation of corporate strategies.

There is ample evidence in the literature that stock repurchases generate significantly positive announcement-period abnormal returns. Fixed-price or Dutch-auction tender offers seem to generate much larger positive returns than open market repurchases. Several studies report average abnormal announcement-period returns of 3 - 5% for open market repurchases (see Dann, 1981; Vermaelen, 1981; Comment and Jarrell, 1991; Ikenberry, Lakonishok, Vermaelen, 1995; Grullon and Michaely, 2002; Chan, Ikenberry, and Lee, 2004), and 8 - 15% for fixed-price or Dutch-auction tender offers (Comment and Jarrell, 1991; Louis and White, 2007). The stock markets react positively to repurchase announcements.

The academic literature has explored a number of alternative explanations of stock repurchases. One popular hypothesis is that repurchases signal managerial beliefs about share-price undervaluation (Vermaelen, 1981; Lakonishok and Vermaelen, 1990; Ikenberry, Lakonishok and Vermaelen, 1995; Stephens and Weisbach, 1998; Dittmar, 2000; D'Mello and

Schroff, 2000; Chan, Ikenberry and Lee, 2004; Peyer and Vermaelen, 2005). Open-market stock repurchase is also thought to be a commonly used method of distributing excess cash flows to the shareholders (Stephens and Weisbach, 1998; Nohel and Tarhan, 1998; Dittmar, 2000; Grullon and Michaely, 2004; Skinner, 2008). Several other theories have also been proposed to explain stock repurchases. Companies may repurchase shares to improve their leverage ratios (Vermaelen, 1981; Bagwell and Shoven; 1988; Opler and Titman, 1996), fend off unwanted takeover attempts (Bagwell, 1991), or to counter the dilution effects of employee stock option plans (Fenn and Liang, 2001; Kahle, 2002).

Of these various hypotheses the signaling (undervaluation) hypothesis and the free cash flow hypothesis have received the most attention in the academic literature. However, the results of a few recently conducted industry surveys (and of a recent academic study) cast doubts about the validity of the signaling (undervaluation) hypothesis (see Baker, Powell, and Veit, 2003; Brav, Graham, Harvey, and Michaely, 2005; Dittmar and Dittmar, 2008). These studies suggest that firms repurchase shares primarily to distribute free cash flows to shareholders, and not necessarily to signal share-price undervaluation. The lack of support for the signaling hypothesis in this recent literature is remarkable, given its recognition in the earlier academic literature. In this paper, we reexamine the evidence using stock repurchase data from 1994 to 2007. We examine whether the announcement-period wealth effect is related to the various attributes of the program, such as the method used for repurchasing shares, the stated purpose of the program, the method of financing, and the program size.

Our study differs from previous studies in several important ways. Previous studies generally use smaller sample sizes. We include all repurchase program announcements that are listed in the SDC Platinum database between 1994 and 2007. The SDC Platinum database has

the most detailed and accurate information on stock repurchases announcements. Also, earlier studies examine either open market repurchases or Dutch-auction/fixed-price tender offers. We examine all reported types of share repurchases (including privately negotiated stock repurchases). We also examine whether the wealth effect depends upon the different characteristics of the announced programs. The SDC Platinum database reports different features of repurchase programs, such as the method of repurchase, the stated purpose of the program, sources of funding, the initial size of program, completion percentages, etc. We expect to gain a better understanding about the true motivations behind the decision to repurchase by linking the wealth effect to these attributes of the programs.

The main results of our paper can be summarized as follows. We find that the median size of firms announcing repurchases has increased dramatically in recent years (since 2003). The median market value of repurchasing firms has increased from about \$200-\$300 million in the early two-thirds of our sample period to between \$400 and \$1,200 million in the latter one-third of our sample. The total dollar amount of repurchases has also increased rather dramatically in the more recent time period. Since bigger firms generally have less information asymmetries than smaller firms, share-price undervaluation for these firms should be less prevalent than for smaller firms. We find some evidence supporting the signaling hypothesis in the early part of our sample period (1994-2002). However, data from the more recent time period do not support the signaling hypothesis. The data show that firms that list ‘undervalued shares’ as the reason for repurchasing shares are smaller than firms listing other reasons. Moreover, the number of firms listing ‘undervalued shares’ as the rationale for repurchasing shares has declined in recent times. The wealth effect of repurchase announcements has also declined drastically in the recent time period. The average cumulative abnormal return (CAR)

for the three-day announcement event window (0, +2) has declined from over 3% before 2003, to under 2% since 2003.

We also find that firms announcing open-market stock repurchases experience significantly large pre-announcement period negative abnormal returns (about 6% on average in the 30-days prior to the announcement). The pre-announcement returns for the other types of repurchases (tender offers, negotiated offers, etc.) are slightly positive. However, the three-day announcement period positive share-price bounce is much larger for Dutch-auctions and for fixed-price tender offers than for open market repurchases. Rau and Vermaelen (2002) argue that open market repurchase announcements simply authorize managers to purchase shares in the future at their discretion. Therefore, these should not be viewed as firm commitments to actually repurchase the shares. Our evidence is consistent with the idea that tender offers are used to convey managerial optimism about future prospects of the firm. Overall, our results support the findings of recent surveys that the primary motivation for repurchasing shares may have changed over time from signaling undervaluation to other possible reasons.

Our paper is organized as follows. Section 2 describes the data and our sample. Section 3 presents the main empirical results of the paper. Summary and concluding remarks are in Section 4.

## 2. Data

The sample is drawn from the SDC Platinum Mergers and Acquisitions database. The database contains information on stock repurchases since the 1980s. We choose 1994 as the starting year of our sample because the data coverage seems to be more comprehensive since 1994. The data includes repurchase programs announced by firms that are listed on the NYSE,

AMEX, or the NASDAQ. The initial authorization date (IAD) of a program is the date that the company's board of directors first authorizes the repurchase program. A repurchase program may have multiple board authorizations. These subsequent announcements authorize changes in the previously announced programs, such as an expansion of an existing program. We exclude these subsequent authorizations from our sample. Repurchase programs that are announced within a month of a previously announced program are also excluded from the sample.

To remain in our sample, repurchasing firms must have data available on the CRSP and the Compustat tapes during the pre-event estimation period and the event period. Our final sample consists of 11,862 repurchase programs that were announced between 1994 and 2007. These 11,862 repurchase programs were announced by 5,200 different firms.

Table 1 reports some descriptive statistics. The number of program announcements peaked in 1998 with 1,396 cases, which declined gradually to 826 cases in 2007. The table also reports sample median values for the percentage of outstanding shares authorized for repurchase at the initial authorization date (PSIAD), the total dollar value authorized at the initial authorization date (VIAD), the total dollar value authorized from the beginning date to the ending date of a repurchase program (TVA), the total number of shares authorized from the beginning date to the ending date of a repurchase program (TSA), the total dollar amount spent on completing the repurchase program (TVR), and the market value of the repurchasing firm's equity at the initial authorization date (MVE). TVA and VIAD may not be equal because repurchasing firms often authorize additional share repurchases after the initial authorization. The reported TVA and TSA numbers include repurchases that were authorized after the initial authorization.

The average size of the programs did not change much from year to year until about 2002. Value authorized at the initial authorization data (VIAD) stayed between \$10 million and \$17 million, total value authorized (TVA) was about \$5 million more than VIAD, and the total number of shares authorized (TSA) was between 1 and 1.5 million shares. The program size increased rapidly after 2002. Median TVA jumped to \$30 million in 2003 and then increased to \$66.8 million in 2007. TSA was 1.83 million shares in 2003 and 2.5 million shares in 2007. The actual cost of completing a repurchase program (TVR) followed the same pattern, increasing from \$13.7 million in 2002 to \$50.6 million in 2007. The median market capitalization of the repurchasing firms (MVE) was between \$200 and \$300 million until 2002. MVE jumped to \$407 million in 2003 and to \$1,086 million in 2007.

(Insert Table 1 about here)

Although the size of the programs increased dramatically after 2002, the relative size of the programs (relative to the company's market capitalization or total shares outstanding) stayed within a narrow range. The median percentage of shares authorized at the initial authorization date (PSIAD) varied between 5% and 6% between 1994 and 2007.

We next classify the sample based on different features of the announced programs. Panel A of Table 2 shows the different methods that are used to repurchase shares. There are four basic methods that are used. In an open market repurchase, the company buys back shares in the open market typically over a long period of time. Management retains the right to decide whether, when, and how many shares are actually repurchased. In a fixed-price tender offer, the company offers to buy a specified number of shares at a given price (which is typically set at a significant premium over the current market price) until a stipulated expiration date. The offer may be made conditional upon receiving tenders for a minimum number of shares. The

company generally reserves the right to withdraw the offer before the expiration date, to extend the offer if fewer than the desired number of shares are tendered, to buy more than the number specified, or to purchase the shares on a pro rata basis if the offer is oversubscribed. If the number of shares tendered is fewer than the number that was originally indicated in the offer, management typically buys all the tendered shares.

A Dutch-auction offer specifies the number of shares and a range of prices (instead of a single offering price) within which the shares will be purchased. The tendering shareholders specify the number of shares that they wish to sell, and the minimum acceptable price within the range. Auctions give repurchasing firms much greater flexibility in sizing and pricing the deal. Finally, negotiated or private repurchases entail buying a block of shares from a large shareholder through direct negotiations. The negotiations can be initiated either by the repurchasing firm or by the shareholder. A combination of these four different methods can also be employed in a repurchase program.<sup>2</sup>

Panel A of Table 2 shows that open market repurchase is the most commonly used method, accounting for 54.45% of our sample. The next most commonly used method (37.19% of our sample) is a combination of open market and negotiated (or private) repurchase. Negotiated repurchases account for 4.30% of the sample. The remainder of our sample is almost equally divided between Dutch-auction tender offers (2.19%) and fixed-price tender offers (1.88%).

Panel A also reports the percentage of shares authorized at the initial authorization date (PSIAD), the total dollar value authorized at the initial authorization date (VIAD), the total dollar value authorized over the life of the program (TVA), and the median market value of equity (MVE) of the repurchasing firms. MVE varies widely from method to method. The median



MVE for the Dutch-auction group is large at \$380 million, which is more than twice the median MVE for the fixed-price tender offers (\$152 million).

Total value authorized (TVA) is largest for the Dutch-auction group at \$57 million, compared to only \$21.5 million for the fixed-price tender offers. The percentage of shares authorized at the initial authorization date (PSAIAD) is only 5% for the open market repurchases, whereas it is much larger at 13.63% for the Dutch-auctions, and 15% for the fixed-price tender offers. The offering price is at an average premium of 7.6% for the Dutch-auction offers and 8.0% for the fixed-price tender offers over the announcement-day market price of the shares.

Panel B of Table 2 reports management's stated reasons for announcing the share repurchase programs. Some firms state a specific purpose in their press release. For example, when L-3 Communication announced its first-ever stock repurchase program on December 18, 2006, the firm announced that "it is a new addition to that company's use of cash to enhance shareholder value."<sup>3</sup> On June 16, 2006, Herley Industries offered the following rationale for their stock repurchase program – (the firm) "believes the common stock of the company is undervalued."<sup>4</sup>

Fewer than 30% of the firms in our sample disclose a specific purpose. The announcements where no specific purposes are disclosed are coded as "General Corporate Purpose" announcements. The SDC Platinum dataset reports eleven different rationales for stock repurchases, including "Enhance Shareholder Value," "Undervalued" (shares), "Stock Option Plan," "Employee Benefits Plans," "Offset Dilution Effect," "Acquisition Purpose," "Prevent Takeover," etc. Many programs list only one specific purpose. However, some programs also list multiple purposes. In the cases where multiple purposes are listed, we classify the programs according to the purpose that is listed first.

Of the 11,862 repurchase programs in our sample, 3,337 programs disclose at least one specific purpose. Among these, “Enhance Shareholder Value” accounts for 1,646 cases, or 14.03% of the sample. The SDC Platinum dataset does not provide detailed explanations regarding the meaning of each stated purpose. As discussed previously, firms can “Enhance Shareholder Value” in various ways – by distributing excess cash to the shareholders, by changing the leverage ratios toward the optimal capital structure, by avoiding dividend taxation, by reducing agency costs, etc.

Only 613 programs list “Undervalued” shares as the stated reason for repurchasing shares (5.23% of the sample). As discussed earlier, the academic literature posits that managers repurchase shares primarily to signal private information about share-price undervaluation. However, only a small fraction of our sample lists “Undervalued” shares as the stated reason for repurchasing shares. The other listed purposes include “Stock Option Plan” (4.30% of the sample), “Employee Benefits Plans” (2.86% of the sample), and “Offset Dilution Effect” (2.03% of sample). A tiny fraction of the firms in our sample list other purposes. We do not include these cases in Panel B. The percentages listed in Panel B are generally consistent with the results that are reported in industry survey studies that list managerial rationale for stock repurchases (Wansley, Lane, and Sarkar, 1989; Tsetsekos, Kaufman, and Gitman, 1991; Baker, Powell, and Veit, 2003; Brav, Graham, Harvey, and Michaely, 2005).

Panel B shows that firms listing “Undervalued” shares are much smaller than firms listing other purposes. The median market value of equity for the “Undervalued” group is only \$140 million, compared to the sample median of \$370 million. This result is consistent with the notion that share-price undervaluation is most common among small firms, since small firms are likely to have large information asymmetries between insiders and outsiders. Thus small firms

repurchase shares to signal undervalued prices of shares. Almost all of the firms that announce fixed-price and Dutch-auction tender offers (and disclose a specific purpose) list “Enhance Shareholder Value” as the reason for repurchasing shares. Firms announcing open market repurchases list various reasons – 55% list “Enhance Shareholder Value,” 24% list “undervalued” shares, and 12% specify “Employee Benefit Plans” as their reasons for repurchasing stocks. We also find that the number of cases listing “Undervalued” shares as the rationale has decreased sharply since 2002. The number has decreased from 50 programs in 2002 to only 20 in 2003, 7 in 2004, and 5 in 2005.

(Insert Table 2 about here)

The academic literature has largely ignored the issue of financing methods used to repurchase shares. In our sample of repurchase programs, 77% do not disclose the source of funding (Panel C, Table 2). For the remaining 23% of our sample, 17 different funding sources are listed on the SDC Platinum database. Some examples of listed funding sources are “Cash from Operation,” “Cash Reserves,” “Debt Securities,” “Borrowing,” “Revolving Line of Credit,” “Common Stock Offering,” etc. Most repurchase programs are primarily funded from two or three different sources. For example, a repurchase can be financed in part by borrowing, and in part by using the firm’s cash reserves. Based on our subjective assessment of each program, we classify these into four financing groups: cash-financed programs, debt-financed programs, programs funded by cash and debt, and stock-financed programs. The associated statistics are reported in Panel C of Table 2. 15.78% of the programs are cash-financed, whereas 4.80% are financed by issuing new debt. In a small percentage of the cases (0.29%), stock is issued to finance the programs.<sup>5</sup> Among the cash-financed repurchases, more programs utilize “Cash Reserve” than “Cash from Operations.” These results are somewhat consistent with previous

studies that report that repurchases are financed with temporary cash flows (Jagannathan and Stephens, 2003; Baker et al., 2003). Incidentally, cash and debt are almost equally used to finance fixed-price and Dutch-auction tender offers, whereas cash is the main source of funding for open market repurchases.

### 3. Empirical Results

#### 3.1. Announcement Returns

We estimate market model parameters by regressing each firm's daily return on the CRSP value-weighted index return over 255 trading days, beginning on day -301 and ending 46 trading days before the announcement date. Daily abnormal returns from  $t = -10$  to  $t = +10$  are reported in Table 3.<sup>6</sup> Table 3 also reports parametric (Patell test) and non-parametric test (Corrado Rank test) statistics ( $Z$  statistics and the associated p-values are reported) to assess significance of the abnormal returns. The non-parametric test is well-specified, and is more powerful at detecting a false null hypothesis of zero abnormal return, when the assumption of normality is violated. Therefore, we base our conclusions on the results of the non-parametric test.

The results in Table 3 can be summarized as follows: 1) Daily abnormal returns are consistently negative until the day prior to the announcement date; 2) Significantly positive market reaction starts from the announcement day ( $t = 0$ ) and continues for three days; 3) After the three-day announcement-period, the daily abnormal returns are small and statistically insignificant.

(Insert Table 3 about here)

Consistent with the economic explanations of the wealth effect of stock repurchases, the announcement of a repurchase program is received favorably by the market. The announcement-

day abnormal return is 1.69% (rank Z-value = 12.04). This is followed by a positive abnormal return of 0.85% (rank Z-value = 6.89) on day 1, and then by 0.18% (rank Z-value = 1.72) on day 2. The abnormal returns from day 3 are small and insignificantly different from zero.

Previous studies have reported that repurchase programs typically follow a period of significant abnormal stock price declines, but that the share prices bounce back on the announcement date (Vermaelen, 1981; Lakonishok and Vermaelen, 1990; Ikenberry, Lakonishok, and Vermaelen, 1995; Stephens and Weisbach, 1998; Jagannathan and Stephens, 2003; Peyer and Vermaelen, 2005). This finding is consistent with the implications of the signaling or undervaluation theory, or is at least consistent with the argument that companies time their repurchases to coincide with temporary declines in their stock prices.

Table 4 reports the average cumulative abnormal returns (CAR) for various windows relative to the announcement date (day 0). We examine CARs from day -180 to day +180 relative to the announcement day at 30-day intervals. The rank Z-values in Panel A show that significant stock price declines begin about 120 days prior to the announcement date. The CAR over the window (-120, -1) is -11.84%. The significantly negative abnormal returns begin much earlier than what Ikenberry, Lakonishok, and Vermaelen (1995) report. Ikenberry, Lakonishok, and Vermaelen (1995) observe significantly negative abnormal returns starting from 20 days before the announcement date, and ending 3 days before the announcement. Also, the negative 30-day CARs become larger as we get closer to the announcement day. The CAR over the windows (-120, 91), (-90, -61), (-60, -31), and (-30, -1) are -1.09, -1.60%, -3.29%, and -5.86%, respectively.

(Insert Table 4 about here)

Upon closer examination of the data, we find that the pre-announcement CARs are negative only for the open market and the open market/negotiated repurchases. We do not observe the same pattern of negative pre-announcement CARs in fixed-price and Dutch-auction tender offers. It is possible that firms experiencing large declines in share prices in the pre-announcement period choose open-market repurchase to signal undervaluation. Open market repurchases allow firms greater flexibility and control (than tender offers) to time the market to capitalize on the underperformance of their stock.

We also examine post-announcement abnormal returns. Panel B of Table 4 shows negative but insignificant CARs over different windows after the announcement. Although we only examine CARs for up to six months after the announcement, our results contradict some of the findings that are reported in the literature. Several studies report that repurchase announcements are followed by long-run return drifts in the U.S., Canada and Britain, as the markets tend to under-react to the information contained in the announcements (Ikenberry, Lakonishok and Vermaelen, 1995 and 2000; Mitchell and Stafford, 2000; Chan, Ikenberry and Lee, 2004; Oswald and Young, 2004). Most of the post-announcement CARs reported in Panel B of Table 4 are negative, but they are statistically insignificant based on the rank Z statistics.

We next examine the wealth effect of repurchase announcements for each year of our sample. Table 5 reports CARs for the announcement period (0, +2) for the total sample and two subsamples. One subsample is the open market repurchase group that includes pure open market repurchases as well as combinations of open market and negotiated (or private) repurchase. Another subsample is the tender offer repurchase group that includes both Dutch-auction tender offers and fixed-price tender offers.

Across all three groups, we find a distinctive change in the magnitude of announcement returns after 2002. For the total sample and open market repurchase subsample, the three-day CAR declined from over 3% before 2003 to below 2% thereafter. For the tender offers, the return declined from the 6 – 13% range before 2003 to below 4% after that. Our multivariate analysis, which is reported in Table 9, confirms the weakened wealth effect even after other deal characteristics such as size, stated purposes, and financing methods are controlled.

Interestingly, this announcement wealth effect change occurs around the same time (around 2003) that bigger firms started repurchasing shares. As we reported in Table 1 earlier, the median size of firms announcing repurchases (and the median size of the announced programs) increased rather dramatically around 2003. The total value authorized (TVA) increased from \$11 - \$23 million before 2002, to \$30 - \$78 million after 2002. Since bigger firms are more widely followed by analysts and investors, information asymmetry is likely to be less severe for such firms. Thus shares of bigger firms are more efficiently priced than shares of smaller firms. We also reported earlier (in Table 2) that firms stating “undervalued” shares as the reason for repurchasing shares tend to be much smaller on average than firms specifying other reasons.

In addition, Skinner (2008) reported that repurchases are increasingly linked to earnings in a manner that suggests they are replacing regular dividends. Also, large, mature, and profitable firms that continue to pay dividends but now also make regular repurchases dominates the cross-sectional distribution of earnings and payouts. The totality of the evidence is consistent with the notion that as bigger firms started repurchasing shares (around 2003), repurchases become the dominant form of payout and the relative importance of the signaling effect (and thus the magnitude of the wealth effect) diminished significantly.<sup>7</sup>

The mean market reaction is decreasing slightly over time. This result is consistent with the notion that because open market programs are relatively low cost to establish and are becoming more common, the market may be growingly accustomed to recurring repurchase programs, thus reducing their informative impact over time.

(Insert Table 5 about here)

### 3.2. Different Types of Repurchase Programs

We next classify the sample by the announced method of repurchase, and examine abnormal returns for each method. It is possible to argue that fixed-price and Dutch-auction tender offers convey the strongest credible signals of managerial conviction about future prospects of the firm, based on the premise that a signal must be costly to be credible. Rau and Vermaelen (2002) contend that open-market repurchase programs do not convey costly signals to the market because these programs do not signify firm commitments on the part of the management to follow through and actually repurchase the shares. It is costless to announce a repurchase program and not to carry it out later. Thus managers who intend to credibly signal their private information may choose a tender offer over an open market program. Open market repurchase programs are simply authorizations, not firm commitments, which allow managers to repurchase shares at their sole discretion.

The results reported in Table 6 are consistent with this argument. The results clearly show that announcement period abnormal returns are much larger for tender offers than for open market repurchases. The three-day CAR is 2.17% for negotiated repurchases, 2.62% for open market repurchases, 2.81% for open market/negotiated repurchases, 4.85% for fixed-price tender offers, and 7.43% for Dutch-auction tender offers. However, our findings differ from the results of earlier studies in a couple of different ways. First, the announcement-period average abnormal returns are much smaller than what have been reported in earlier studies.<sup>8</sup> This may



simply be another manifestation of our earlier finding of much weaker wealth effects in the 2000s than in the 1990s.

Also, we find that Dutch-auction tender offers outperform fixed-price tender offers during the announcement period. The difference of the three-day CAR is significant at the 0.02 level. The significant difference holds even after other deal characteristics such as size, stated purposes, and financing methods are controlled as reported later in Table 9.

(Insert Table 6 about here)

There are two conflicting hypotheses about the relative wealth effects of fixed-price tender offers and Dutch-auction tender offers. One hypothesis is that a fixed-price tender offer provides a more powerful and credible signal of undervaluation than a comparable Dutch-auction offer because a fixed-price offer specifies a single purchase price in advance, whereas a Dutch-auction guarantees a relatively low (minimum) offer price. Since the purchase price in a Dutch-auction offer is determined by the tendering shareholders, it is less informative (about private managerial signals) than the price specified in a fixed-price offer (see Ramsay and Lamba, 2000). The implication is that fixed-price tender offers should produce larger wealth effects than Dutch-auction offers.

However, we find that Dutch-auction tender offers have a higher completion rate than fixed-price offers in the SDC Platinum database. Only 7 of the 258 announced Dutch-auction tender offers in our sample are either terminated, expired, or suspended. The number of terminated, expired, or suspended fixed-price offers is 22 out of a total of 222 announced programs. The probability of non-completion of fixed-price tender offers is more than three times that for Dutch-auction offers. The higher probability of under-subscription for fixed-price offers can lead to the weaker market reaction to the announcement.<sup>9</sup> The results in Table 6

contradict the commonly-held view that fixed-price offers exhibit larger announcement-period wealth effects than Dutch-auction offers because fixed-price offers convey more credible signals of undervaluation.

We also find that the firms that specify “Enhance Shareholder Value” as the purpose for repurchasing shares tend to choose tender offers over open market repurchase. This leads us to believe that firms do not announce tender offer repurchase programs to signal undervaluation.

Privately negotiated offers experience the smallest positive CAR (2.05%) during the three-day announcement period. Past studies of the wealth effect of privately negotiated repurchases offer mixed results. Dann and DeAngelo (1983), Bradley and Wakeman (1983), and Klein and Rosenfeld (1988) report that private repurchases are associated with significantly negative announcement returns. On the other hand, Peyer and Vermaelen (2005) report significantly positive announcement-period return of 1.81%, which is close to our estimate of 2.05%.

Table 6 also shows that pre-announcement (-30, -1) returns are negative only for the open market and the open market/negotiated repurchase programs. The pre-announcement CARs are 2.23% for fixed-price tender offers, 1.40% for Dutch auctions, 0.98% for negotiated repurchases, -5.75% for open market repurchases, and -6.72% for open market/negotiated repurchases. Negative pre-announcement returns and positive announcement-period returns are usually interpreted as evidence that firms use repurchases to signal share-price undervaluation. Our results are consistent with the idea that firms that significantly underperform during the pre-announcement period announce open market repurchases to signal undervaluation. However, the strength of the signal seems to have decreased in recent time periods.

### 3.3. Stated Purpose of Repurchase Programs

We next categorize the repurchase programs in our sample according to the various stated purposes of the programs and examine the CARs (see Table 7). Not surprisingly, the largest announcement-period (0, +2) positive CAR is observed for the “Undervalued” group (4.80%). This group also experiences the largest negative pre-announcement CAR of -11.58%. This may indicate that the stated purposes are credible and the market reacts accordingly. The evidence also suggests that managers possess at least some ability to detect undervaluation and to time the market. Managerial surveys generally support this view of market timing ability. Graham and Harvey (2001) report that two-thirds of the CFOs surveyed acknowledge that they issue equity to take advantage of mispricing. In another widely cited survey of high-level executives, Brav et al. (2005) report that over 80% of firms initiate stock repurchase programs when their stock is judged to be good value relative to other investments.

The “Enhance Shareholder Value” group earns the next highest announcement-period CAR of 2.94%. The SDC Platinum dataset does not provide a clear explanation of enhancing shareholder value. We interpret this as augmenting value for the shareholders by various means, such as by distributing excess cash, adjusting debt ratios toward the optimal capital structure, reducing agency costs of free cash-flow, etc. The significantly positive CAR indicates credibility of the stated purpose of the programs.

(Insert Table 7 about here)

The lowest announcement-period CARs are earned by repurchase programs specifying “Offset Dilution Effect” and “Employee Benefits Plans” as purposes (1.37% and 1.78% respectively). Executive stock option plans more than tripled during the late 1990s and are probably related to the growth in repurchase programs during the same period (see Table 1).

Firms sometimes repurchase shares to fund the exercise of executive and employee stock options. Executives may have a strong incentive to repurchase shares to preserve the value of their stock options. Since dividend payments decrease the value of stock options, managers choose repurchases over dividends to distribute excess cash flows to shareholders (Lambert, Lanen, and Larcker, 1989).

### 3.4. Sources of Financing

We next examine the different financing methods that are used to repurchase shares and the associated CARs. The results (reported in Table 8) show that the announcement period returns for debt-financed repurchases and cash repurchases are virtually identical. When a stock repurchase program is financed with a debt issue, the firm's capital structure can change significantly. However, the results show that debt-financed programs and cash-financed programs have similar announcement-period CARs. The programs that are financed with a combination of cash and debt have the highest average CAR of 3.00%. At the other extreme, stock-financed programs earn the lowest CAR of 1.45%. The difference in the CARs between the debt- or cash-financed programs, and the stock-financed programs are significant. Although the sample size for the stock-financed group is relatively small, the results are consistent with the idea that the markets generally do not favor equity issuances. Perhaps the negative wealth effect of the equity issuance partially negates the positive wealth effect of the repurchase announcements in this sub-sample.

(Insert Table 8 about here)

### 3.5. Multivariate Analysis

To investigate the wealth effect of firm size, program size, announcement year, pre-announcement stock returns, repurchase methods, and financing methods while other factors are held constant, a cross-section ordinary least-square regression is estimated. The dependent variable is the three-day ( $t = 0$  to  $+2$ ) cumulative abnormal return. The independent variables include (1) the percentage of shares authorized at the initial authorization date (the number of shares authorized divided by the total number of shares outstanding); (2) the pre-announcement abnormal returns over the window  $(-120, -1)$ ; (3) log market value of equity of the repurchasing firm; (4) a dummy variable equal to 1 if a repurchase program was announced after 2002, and 0 if otherwise; (5)-(7) three classification variables for the repurchase methods, Dutch-auction tender offer, fixed-price tender offer, and open market repurchase; (8)-(11) five classification variables for the stated purposes of repurchase, “Undervalued,” “Enhance Shareholder Value,” “Offset Dilution Effect,” “Employee Benefits Plan,” and “Employee Stock Option.” The matrix of the two classification variables is constructed by using the SAS GLMMOD procedure. The cross-sectional regressions are estimated for the total sample period (1994-2007), and separately for two subsample periods: 1994-2002, and 2003-2007. The results are reported in Table 9. The overall results of the regression analysis reinforce the earlier analysis.

The coefficient of the program size variable is significantly positive in all the regressions. The market reacts more favorably to larger programs, which confirms McNally’s (1999) earlier finding that the market reaction depends on the size of the announced programs. A repurchase program may have to be of a minimum size in order to send a credible signal to the market, which can trigger a revaluation of the stock’s price by the market.

Earlier we presented drastically declined announcement returns in the recent time period (in Table 5). The dummy variable in this regression, which distinguishes repurchase programs

announced after 2002, is highly significant. This confirms the weakened wealth effects in the 2000s, while controlling for other deal characteristics that may affect the announcement returns.

The pre-announcement CARs are significantly negatively related to the announcement-period CARs in the total sample, and in the 1994-2002 subsample. This is consistent with the implications of the signaling hypothesis. If repurchase announcements signal undervalued prices of shares then the announcement-period bounce should be negatively correlated with pre-announcement returns. However, we do not find the same result in our second subsample (2003-2007). The pre-announcement CARs are positively (but insignificantly) correlated with the market reaction at the announcement in this sample. The results indicate lack of support for the signaling hypothesis in the modern time period.

(Insert Table 9 about here)

We also find that the market values of the repurchasing firms' equity are negatively related to the announcement-period CARs. This is consistent with the view that since smaller firms have greater information asymmetries, such firms are more likely to be undervalued than bigger firms. Lakonishok and Vermaelen (1990) argue that small firms use repurchases to signal undervaluation, whereas big firms have other motivations for repurchasing stock. Small firms that are undervalued are likely to buy back shares to take advantage of mispriced shares.

Among the three classification variables of repurchase methods, the coefficient of the Dutch-auction variable is highly significantly positive in all three regressions whereas the coefficient of the open market variable is significantly negative. These results confirm our early finding that Dutch-auction tender offers (open market repurchases) experience the largest (smallest) wealth effect.

Finally, among the five variables that classify stated purposes, the “Undervalued” variable is positively significant in the total sample only, while none of other variables is significant in any of the samples. These results support our earlier argument that the managers possess some ability to detect undervaluation and to the time the market.

#### 4. Summary and Conclusions

The finance literature has empirically examined several different motivations for stock repurchases using data from the 1980s and the 1990s. However, the results of several recent surveys indicate that management’s reasons for repurchasing shares may have changed during the past decade. In this paper we reexamine the wealth effect of stock repurchase announcements in order to understand the true motivations for stock repurchases.

We collect data for 11,862 repurchase programs that were announced between 1994 and 2007 from the SDC Platinum dataset. Our sample consists of open market repurchases (54.45% of the sample), combination of open market and negotiated (or private) repurchases (37.19% of the sample), negotiated repurchases (4.30% of sample), Dutch-auction tender offers (2.19%), and fixed-price tender offers (1.88% of the sample).

We find that significant decline in stock prices commence from about 120 days before the announcement date. The decline in stock price seems to accelerate as the announcement date approaches. The average cumulative abnormal return (CAR) over the window (-120, -1) is -11.84%. Incidentally, the pre-announcement decline in stock price is observed for open market and open market/negotiated repurchases only. We do not find significantly negative pre-announcement abnormal returns for other types of repurchases.

Our results show that significantly positive stock price reaction begins from the announcement day and lasts for three days. The average CAR over the window (0, +2) is 2.72%. However, when we examine the average announcement period CAR by year, we find that the CAR has declined from over 3% before 2003 to under 2% after 2003. We also provide evidence that the announcement period CARs were significantly negatively correlated with preannouncement CARs only for the repurchase programs that were announced before 2003. When we examine the stated purposes of the repurchase programs, we find that the number of programs listing “Undervalued” (shares) has decreased significantly since 2003. Overall, we do not find much support for the signaling hypothesis in the post-2002 data. This is consistent with the findings of recent industry surveys by Baker, Powell, and Veit (2003) and Brav, Graham, Harvey, and Michaely (2005).

We also find that Dutch-auction tender offers experience larger announcement period positive returns than fixed-price tender offers. This contradicts some of the results in the extant literature. Our results suggest that firms choose open market repurchases to signal undervalued shares. By comparison, tender offers are not chosen to signal undervaluation, but to enhance shareholder values by other means. Open market announcements provide the repurchasing firms with enormous flexibility, which may result in superior market timing ability. Managerial market timing ability is somewhat supported by our results. When we examine the stated purposes of the repurchase announcements, we find that most programs that specify “Undervalued” (shares) as the primary purpose are open market repurchases. Also, programs specifying “Undervalued” (shares) as the reason for repurchasing shares experience the highest negative pre-announcement average CAR and the highest positive announcement period CAR.



These results are consistent with managerial ability to opportunistically time the announcement of open market repurchase programs to take advantage of undervaluation of the stock.

Table 1  
Sample Statistics

The table reports the number of repurchasing programs (N) announced each year during 1994 – 2007. Also reported are each program’s percentage of shares authorized at the initial authorization date (PSAIAD), which is calculated by dividing the total number of shares authorized to repurchase by the total number of shares outstanding at the initial authorization date, the total dollar value authorized at the initial authorization date (VIAD), the total dollar value authorized from the beginning date to the ending date of a repurchase program (TVA), the total number of shares authorized from the beginning to the end of a repurchase program (TSA), the total value spent to complete the repurchase program (TVR), and the market value of the repurchasing firm’s equity at the initial authorization date (MVE). All the statistics reported are median values for the sample in each year.

Year	N	PSAIAD (%)	VIAD (\$ mil)	TVA (\$ mil)	TSA (mil)	TVR (\$ mil)	MVE (\$ mil)
1994	762	5.00	10.5	16.7	1.00	9.4	245
1995	740	5.00	10.0	15.2	1.00	10.1	194
1996	922	5.11	11.6	17.4	1.00	9.0	226
1997	877	5.29	17.3	22.5	1.29	15.1	298
1998	1,396	5.59	12.8	19.5	1.38	10.9	275
1999	1,163	5.57	12.6	17.4	1.50	10.0	254
2000	1,005	6.17	12.8	16.3	1.50	8.1	245
2001	863	5.00	10.2	11.4	1.09	6.7	174
2002	704	5.28	14.1	16.4	1.50	13.7	289
2003	545	5.20	26.0	30.0	1.83	25.0	407
2004	629	5.01	50.0	62.2	2.80	55.1	1,017
2005	728	5.39	60.0	78.1	3.24	70.7	1,213
2006	702	5.57	63.0	77.6	2.75	67.6	1,110
2007	826	6.09	60.0	66.8	2.50	50.6	1,086

Table 2  
Different Features of the Repurchase Programs in the Sample

Panel A: Repurchase Method

The SDC Platinum database reports eight different repurchase methods. This table includes five main methods. The numbers of observations for the other three methods are small. The table shows the number of repurchase programs announced during 1994 to 2007, the percentage of the total sample, the percentage of shares authorized at initial authorization date (PSAIAD), the total value authorized at initial authorization date (VIAD), the total value authorized (TVA), and the market value of the repurchasing firm's equity at the initial authorization date (MVE). All the reported numbers are the median values for the sample.

Technique	N	%	PSAIAD (%)	VIAD (\$ mil)	TVA (\$ mil)	MVE (\$ mil)
Open Market	6,427	54.45	5.00	18.8	23.3	373
Open Market/Negotiated	4,389	37.19	5.35	20.0	25.9	447
Negotiated	507	4.30	7.84	16.1	16.5	209
Dutch Auction	258	2.19	13.63	56.7	57.0	380
Fixed-Price	222	1.88	15.00	19.3	21.5	152

Panel B: Stated Purpose of Repurchase

Among the 11,862 repurchase programs in our sample, 3,337 repurchase programs disclose specific purposes. For these 3,337 cases, the SDC Platinum dataset reports a total of 11 different purposes. This table reports statistics for 5 commonly specified purposes and "General Corp Purpose." A small number of programs list other purposes – we exclude those from the Table. In cases where multiple purposes are listed for a repurchasing program, we assume that the first listed purpose is the primary purpose.

Purpose	N	%	PSAIAD (%)	VIAD (\$ mil)	TVA (\$ mil)	MVE (\$ mil)
General Corp Purpose	8,393	71.55	5.30	20.1	25.0	408
Enhance Shareholder Value	1,646	14.03	5.74	19.5	25.0	360
Undervalued	613	5.23	5.72	7.3	10.0	140
Stock Option Plan	504	4.30	5.00	16.9	26.9	403
Employee Benefits Plans	336	2.86	5.00	16.8	27.4	401
Offset Dilution Effect	238	2.03	4.64	50.5	85.5	1,157

Panel C: Sources of Funding

For the firms that disclose the sources of funding, our database identifies 17 different sources. A careful examination reveals that most repurchase programs are funded from two or three different sources. Based on our subjective judgment, we classify the programs by four major funding sources: cash, debt, cash/debt, and stock.

Source of Funds	N	%	PSAIAD (%)	VIAD (\$ mil)	TVA (\$ mil)	MVE (\$ mil)
Undisclosed	9,431	77.01	5.14	17.9	21.5	355
Cash	1,933	15.78	5.65	25.0	34.0	489
Debt	588	4.80	6.98	30.0	42.0	506
Cash/Debt	259	2.11	7.55	32.8	50.0	574
Stock	36	0.29	5.00	28.7	30.0	348

Table 3  
Daily Average Abnormal Returns

We calculate daily abnormal returns from  $t = -10$  to  $t = +10$  using the market model. For the parametric test, the Patell test Z-values and p-values are reported. For the non-parametric test, the ratios of positive to negative returns and the Corrado Rank Test Z-values and p-values are reported.

Day	N	AR	Positive: Negative	Z-value	p-value	Rank Test Z	p-value
-10	11,859	-0.23%	0.45:0.55	-9.495	<.0001	-2.11	0.0358
-9	11,859	-0.22%	0.45:0.55	-8.811	<.0001	-2.16	0.0312
-8	11,859	-0.24%	0.44:0.56	-9.496	<.0001	-2.43	0.0157
-7	11,858	-0.16%	0.46:0.54	-7.659	<.0001	-1.70	0.0894
-6	11,857	-0.27%	0.45:0.55	-10.035	<.0001	-2.49	0.0132
-5	11,857	-0.31%	0.45:0.55	-12.658	<.0001	-2.92	0.0038
-4	11,857	-0.20%	0.45:0.55	-8.732	<.0001	-1.89	0.0602
-3	11,856	-0.31%	0.45:0.55	-12.265	<.0001	-2.69	0.0076
-2	11,856	-0.28%	0.46:0.54	-10.000	<.0001	-1.73	0.0842
-1	11,854	-0.25%	0.47:0.53	-8.398	<.0001	-1.12	0.2620
0	11,858	1.69%	0.63:0.37	64.792	<.0001	12.04	<.0001
1	11,856	0.85%	0.56:0.44	35.704	<.0001	6.89	<.0001
2	11,857	0.18%	0.50:0.50	7.191	<.0001	1.72	0.0864
3	11,856	0.10%	0.48:0.52	3.169	0.0015	0.24	0.8101
4	11,856	0.02%	0.48:0.52	1.128	0.2595	0.10	0.9197
5	11,849	0.06%	0.48:0.52	2.355	0.0185	0.46	0.6466
6	11,844	0.06%	0.47:0.53	2.702	0.0069	0.44	0.6589
7	11,839	0.08%	0.49:0.51	2.580	0.0099	0.49	0.6279
8	11,838	-0.03%	0.47:0.53	0.062	0.9505	-0.12	0.9055
9	11,832	0.01%	0.48:0.52	0.891	0.3732	0.01	0.9927
10	11,829	0.02%	0.47:0.53	-0.093	0.9259	-0.14	0.8878

Table 4  
Pre and Post Announcement Returns

Daily abnormal returns are calculated using the market model. The table reports cumulative abnormal returns for various event windows. For the parametric test, the Patell test Z-values and p-values are reported. For the non-parametric test, the ratios of positive returns to negative returns, and the Corrado Rank Test Z-values and p-values are reported.

Panel A: Pre-Announcement Returns

Days	N	CAR	Positive: Negative	Z-value	p-value	Rank Test Z	p-value
(-180,-151)	11,594	-0.22%	0.45:0.55	-2.394	0.0167	-0.355	0.7231
(-150,-121)	11,721	-0.51%	0.46:0.54	-2.745	0.0060	-0.267	0.7898
(-120,-91)	11,779	-1.09%	0.44:0.56	-7.250	<.0001	-1.861	0.0634
(-90,-61)	11,842	-1.60%	0.42:0.58	-12.896	<.0001	-3.530	0.0005
(-60,-31)	11,862	-3.29%	0.39:0.61	-23.891	<.0001	-6.642	<.0001
(-30,-1)	11,861	-5.86%	0.37:0.63	-39.226	<.0001	-10.539	<.0001

Panel B: Post-Announcement Returns

Days	N	CAR	Positive: Negative	Z-value	p-value	Rank Test Z	p-value
(+4,+30)	11,858	0.23%	0.48:0.52	-2.945	0.0032	0.492	0.9260
(+31,+60)	11,720	-0.29%	0.47:0.53	-5.954	<.0001	-0.895	0.2283
(+61,+90)	11,602	-0.52%	0.46:0.54	-7.140	<.0001	-1.782	0.0400
(+91,+120)	11,467	-0.44%	0.46:0.54	-6.732	<.0001	-1.629	0.0405
(+121,+150)	11,269	-0.57%	0.46:0.54	-6.491	<.0001	-1.377	0.1691
(+151,+180)	11,137	-0.31%	0.46:0.54	-5.889	<.0001	-1.690	0.0917

Table 5  
Average Cumulative Abnormal Announcement Returns by Year

Abnormal returns are computed using the market model. The table reports cumulative abnormal returns over the window (0, +2). The open market repurchase subsample includes open market repurchases and combinations of open market repurchase and negotiated repurchase. The tender offer repurchase subsample includes Dutch-auction tender offers and fixed-price tender offers.

Year	Total Sample		Open Market Repurchase		Tender Offer Repurchase	
	N	CAR	N	CAR	N	CAR
1994	762	2.91%	671	2.59%	24	6.40%
1995	740	2.50%	661	2.33%	14	12.98%
1996	922	3.01%	839	2.96%	28	5.88%
1997	877	2.48%	770	2.19%	30	8.43%
1998	1,396	3.69%	1,329	3.55%	31	7.12%
1999	1,163	3.46%	1,066	3.26%	42	8.66%
2000	1,005	4.22%	935	4.05%	48	6.93%
2001	863	3.47%	806	3.26%	35	7.80%
2002	704	4.15%	649	4.02%	26	11.60%
2003	545	1.59%	489	1.36%	39	3.26%
2004	629	1.48%	574	1.35%	36	4.05%
2005	728	1.24%	654	1.04%	43	2.96%
2006	702	1.31%	630	1.22%	47	2.65%
2007	826	1.84%	730	1.62%	37	4.52%

Table 6  
Cumulative Average Abnormal Returns for Different Methods of Repurchase

Daily abnormal returns are calculated using the market model. These are summed over various windows to compute the cumulative abnormal returns. For the parametric test, the Patell test Z-values and p-values are reported. For the non-parametric test, the ratio of positive returns to negative returns, and the Corrado rank test Z-values and p-values are reported.

Days	N	Mean CAR	Positive: Negative	Z-value	p-value	Rank Test Z	p-value
<b>Dutch Auction</b>							
(-30,-1)	258	1.40%	0.53:0.47	2.043	0.0410	-0.043	0.6580
(0,+2)	258	7.43%	0.85:0.15	31.578	<.0001	8.454	<.0001
(+3,+30)	258	1.26%	0.51:0.49	1.145	0.2524	1.492	0.1366
<b>Fixed Price Tender Offer</b>							
(-30,-1)	222	2.23%	0.50:0.50	1.660	0.0969	0.209	0.8347
(0,+2)	222	4.85%	0.64:0.36	14.691	<.0001	3.803	0.0002
(+3,+30)	222	-0.69%	0.46:0.54	-0.204	0.8387	1.477	0.1408
<b>Negotiated</b>							
(-30,-1)	507	0.98%	0.49:0.51	1.236	0.2167	-0.243	0.8085
(0,+2)	507	2.17%	0.59:0.41	9.888	<.0001	5.315	<.0001
(+3,+30)	505	1.27%	0.47:0.53	0.519	0.6036	0.026	0.9791
<b>Open Market</b>							
(-30,-1)	6,427	-5.75%	0.35:0.65	-29.791	<.0001	-9.282	<.0001
(0,+2)	6,427	2.62%	0.66:0.34	43.135	<.0001	11.361	<.0001
(+3,+30)	6,427	0.89%	0.48:0.52	3.197	0.0014	-0.963	0.3366
<b>Open Market/Negotiated</b>							
(-30,-1)	4,389	-6.72%	0.35:0.65	-27.980	<.0001	-9.616	<.0001
(0,+2)	4,388	2.81%	0.66:0.34	36.194	<.0001	10.724	<.0001
(+3,+30)	4,388	1.14%	0.50:0.50	3.170	0.0015	0.273	0.7848



Table 7  
Cumulative Average Abnormal Returns for Different Stated Purposes of the Programs

Daily abnormal returns are calculated using the market model. These are summed over various windows to compute the cumulative abnormal returns. For the parametric test, the Patell test Z-values and p-values are reported. For the non-parametric test, the ratio of positive returns to negative returns, and the Corrado rank test Z-values and p-values are reported.

Days	N	Mean CAR	Positive: Negative	Z-value	p-value	Rank Test Z	p-value
<b>Undervalued</b>							
(-30,-1)	613	-11.58%	0.29:0.71	-15.836	<.0001	-6.812	<.0001
(0,+2)	613	4.80%	0.73:0.27	18.863	<.0001	9.283	<.0001
(+3,+30)	613	1.06%	0.51:0.49	0.322	0.7474	1.166	0.2446
<b>Stock Option Plan</b>							
(-30,-1)	504	-5.97%	0.35:0.65	-7.89	<.0001	-4.203	<.0001
(0,+2)	504	2.15%	0.64:0.36	10.443	<.0001	5.891	<.0001
(+3,+30)	504	1.17%	0.49:0.51	1.399	0.1618	1.127	0.2604
<b>Offset Dilution Effect</b>							
(-30,-1)	238	-4.29%	0.38:0.62	-4.094	<.0001	-4.274	<.0001
(0,+2)	238	1.37%	0.61:0.39	3.312	0.0009	2.912	0.0038
(+3,+30)	238	0.27%	0.50:0.50	-0.004	0.9967	-1.270	0.2052
<b>Enhance Shareholder Value</b>							
(-30,-1)	1,646	-4.62%	0.39:0.61	-12.553	<.0001	-5.319	<.0001
(0,+2)	1,646	2.94%	0.68:0.32	25.030	<.0001	10.614	<.0001
(+3,+30)	1,646	-0.09%	0.49:0.51	-1.551	0.1209	0.624	0.5333
<b>Employee Benefits Plans</b>							
(-30,-1)	336	-3.76%	0.40:0.60	-4.559	<.0001	-2.832	0.0049
(0,+2)	336	1.78%	0.63:0.38	6.517	<.0001	5.496	<.0001
(+3,+30)	336	0.04%	0.52:0.48	-0.602	0.5475	0.601	0.5482
<b>General Corporate Purpose</b>							
(-30,-1)	8,393	-5.52%	0.37:0.63	-33.488	<.0001	-7.683	<.0001
(0,+2)	8,392	2.63%	0.66:0.34	49.903	<.0001	12.241	<.0001
(+3,+30)	8,391	0.34%	0.48:0.52	-2.084	0.0372	0.467	0.6408

Table 8  
Cumulative Average Abnormal Returns for Different Financing Methods

Daily abnormal returns are calculated using the market model. These are summed over various windows to compute the cumulative abnormal returns. For the parametric test, the Patell test Z-values and p-values are reported. For the non-parametric test, the ratio of positive return to negative returns, and the Corrado rank test Z-values and p-values are reported.

Days	<i>N</i>	Mean CAR	Positive: Negative	Z-value	p-value	Rank Test Z	p-value
<b>Debt</b>							
(-30,-1)	588	-4.01%	0.39:0.61	-7.169	<.0001	-3.436	0.0007
(0,+2)	588	2.71%	0.69:0.31	15.598	<.0001	8.559	<.0001
(+3,+30)	588	-0.78%	0.45:0.55	-1.666	0.0957	0.441	0.6594
<b>Cash Reserves</b>							
(-30,-1)	1,933	-6.16%	0.36:0.64	-17.013	<.0001	-5.803	<.0001
(0,+2)	1,933	2.84%	0.68:0.32	26.333	<.0001	10.631	<.0001
(+3,+30)	1,933	0.25%	0.48:0.52	-1.189	0.2346	1.089	0.2769
<b>Cash Reserves/Debt</b>							
(-30,-1)	259	-7.84%	0.31:0.69	-9.008	<.0001	-4.918	<.0001
(0,+2)	259	3.00%	0.16:0.84	9.783	<.0001	5.524	<.0001
(+3,+30)	259	-0.65%	0.44:0.56	-1.821	0.0687	-0.649	0.5168
<b>Stock Offering</b>							
(-30,-1)	36	-5.31%	0.31:0.69	-1.690	0.0910	-0.829	0.4079
(0,+2)	36	1.45%	0.67:0.33	2.788	0.0053	1.243	0.2148
(+3,+30)	36	-0.67%	0.42:0.58	-0.180	0.8571	-0.233	0.8159

Table 9  
Cross-sectional Regression Analysis

The dependent variable is the three-day ( $t = 0$  to  $+2$ ) cumulative abnormal return at the announcement of a repurchase program. The independent variables include (1) authorized shares divided by total number of shares outstanding prior to the announcement year (PSAIAD); (2) cumulative abnormal return from -120 to -1 (Pre-CAR); (3) log market value of equity of the repurchasing firm (MVE); (4) a dummy variable that is 1 if the announcement year is after 2002 or 0 otherwise (Year); (5)-(7) three classification variables for the repurchase methods, which include Dutch-auction tender offer (DA), fixed-price tender offer (FPOL), and open market repurchase (OP); (8)-(11) five classification variables for the stated purposes of repurchase, which include Undervalued (UVL), Enhance Shareholder Value (ESV), Offset Dilution Effect (DIL), Employee Benefits Plan (EBP), and Employee Stock Option (STP). The design matrix of the two classification variables is constructed by using the SAS GLMMOD procedure.  $t$ -values for the coefficients are in parentheses.

	Total Sample	2003 – 2007 Sample	1994 – 2002 Sample
Intercept	0.05893 (18.50)*	0.02628 (6.17)*	0.06940 (16.26)*
Pre-CAR	-0.01358 (-4.95)*	0.00049 (0.12)	-0.01842 (-5.36)*
MVE	-0.00614 (-13.92)*	-0.00275 (-5.05)*	-0.00794 (-13.21)*
PSAIAD	0.00126 (9.67)*	0.00119 (6.29)*	0.00117 (6.88)*
Year	-0.01091 (-5.69)*		
Method-DA	0.03830 (6.75)*	0.02950 (4.70)*	0.04454 (5.41)*
Method -FPOL	0.00406 (0.61)	-0.00019 (-0.03)	0.01252 (1.22)
Method -OP	-0.00339 (-1.93)**	-0.00235 (-1.10)	-0.00461 (-1.93)**
Purpose-UVL	0.00777 (1.99)**	0.01136 (1.40)	0.00679 (1.46)
Purpose -ESV	-0.00187 (-0.76)	-0.00472 (-1.57)	0.00052 (0.16)
Purpose -DIL	-0.00190 (-0.32)	-0.00640 (-0.83)	0.00141 (0.18)
Purpose -EBP	-0.00421 (-0.82)	0.00479 (0.48)	-0.00466 (-0.76)
Purpose -STP	-0.00380 (-0.90)	-0.00898 (-0.82)	-0.00220 (-0.45)
Adjusted R <sup>2</sup>	0.0563	0.0335	0.0528

\* Significant at less than 1%

\*\* Significant at the level of 5%

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<sup>1</sup>[http://www2.standardandpoors.com/spf/pdf/index/121307\\_SP500\\_THREE\\_YEARS\\_OF\\_BUYBACKS.pdf](http://www2.standardandpoors.com/spf/pdf/index/121307_SP500_THREE_YEARS_OF_BUYBACKS.pdf)

<sup>2</sup> For example, Business Wire reported on August 28, 2006 that “Amazon.com, Inc. (the “Company”) announced today that its Board of Directors authorized the Company to repurchase up to \$500 million of the Company's common stock within the next 24 months, through one or more open market transactions, privately negotiated transactions, transactions structured through investment banking institutions or a combination of the foregoing. The Company may do so if it believes its shares are undervalued.”

<sup>3</sup> Business Wire, December 18, 2006.

<sup>4</sup> Business Wire, June 16, 2006.

<sup>5</sup> We are puzzled about why firms sometimes issue shares to repurchase shares. As an example of this, American Oriental Bioengineering announced on June 9, 2008 a stock repurchase program of up to \$75 million, and simultaneously disclosed plans to issue \$125 million in convertible preferred stock in a private offering.

<sup>6</sup> All our conclusions remain the same when we use the Fama-French three-factor model instead of the market model.

<sup>7</sup> We also provide cross-sectional regression evidence later (in Table 9) that announcement-period CARs are significantly negatively correlated with pre-announcement CARs before 2003. The correlation is positive and statistically insignificant between 2003 and 2007. A significantly negative regression coefficient suggests that repurchase announcements signal undervalued share prices. The regression evidence presented in Table 9 strengthens our argument that recent repurchase announcements by relatively bigger firms are made for reasons that may not have much to do with signaling undervalued shares.

<sup>8</sup> Previous studies report abnormal returns of 3-5% for open market repurchases and 8-15% for fixed-price and Dutch-auction tender offers.

<sup>9</sup> Dutch-auction tender offers are also less expensive for the repurchasing firms because the purchase (winning) price in a Dutch-auction is likely to be lower than the purchase price of a fixed-price offer.